Simplify

(a) $\frac{(1+\sqrt{3})}{1-\sqrt{3}} \cdot \frac{(1+\sqrt{3})}{1+\sqrt{3}} = \frac{1+2\sqrt{3}+3}{1-3} = \frac{\cancel{4}+\cancel{2}\sqrt{3}}{-\cancel{2}} = -2-\sqrt{3}$

(b) $\frac{1+\frac{\sqrt{3}}{3}}{1-\frac{\sqrt{3}}{3}} \cdot \frac{1+\frac{\sqrt{3}}{3}}{1+\frac{\sqrt{3}}{3}} = \frac{1+\frac{2\sqrt{3}}{3}+\frac{3}{9}}{1-\frac{3}{9}} = \frac{\frac{4}{3}+\frac{2\sqrt{3}}{3}}{\frac{2}{3}}$

$\frac{4+\cancel{2}\sqrt{3}}{\cancel{3}} \cdot \frac{\cancel{3}}{\cancel{2}}$

$2+\sqrt{3}$

(c) $(\sin x+1)^2 \neq \sin^2 x+1$

$(\sin x+1)(\sin x+1)$

$\sin^2 x+2\sin x+1$

$\sin^4 x - \cos^4 x = 2\sin^2 x - 1$

$\underline{(\sin^2 x + \cos^2 x)}(\sin^2 x - \cos^2 x)$

$1 \cdot (\sin^2 x - \underline{\underline{\cos^2 x}})$

$\sin^2 x - (1 - \sin^2 x)$

$2\sin^2 x - 1$

$x^2 - y^2 \quad (x+y)(x-y)$

$x^2 - 25 \quad (x+5)(x-5)$

$x^4 - 16 \quad (x^2+4)(x^2-4)$

Sine sum Ident. $\sin(A+B) =$

$\sin x = \cos(90-x)$

$\sin(A+B) = \cos[90-(A+B)] \rightarrow [(90-A)-B]$

$\cos[(90-A)-B] = \cos(90-A)\cos B + \sin(90-A)\sin B$

$$\boxed{\sin(A+B) = \sin A \cos B + \cos A \sin B}$$

$\sin(A-B) = \sin(A+-B) = \sin(A)\cos(-B) + \cos(A)\sin(-B)$

$$\boxed{\sin(A-B) = \sin(A)\cos(B) - \cos(A)\sin(B)}$$

$$\tan(A+B) = \frac{\sin(A+B)}{\cos(A+B)} = \frac{\sin A\cos B + \cos A\sin B}{\cos A\cos B - \sin A\sin B}$$

$$\frac{\dfrac{\sin A\cos B + \cos A\sin B}{1}}{\dfrac{\cos A\cos B - \sin A\sin B}{1}} \qquad \frac{\dfrac{1}{\cos A\cos B}}{\cdot\dfrac{1}{\cos A\cos B}} = \frac{\tan A + \tan B}{1 - \tan A\tan B}$$

$$\boxed{\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A\tan B}}$$

$$\boxed{\tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A\tan B}}$$

$$\sin(A+B) = \sin A \cos B + \cos A \sin B$$

$$\sin(A-B) = \sin A \cos B - \cos A \sin B$$

$$\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

Sect. 5.2 #9, 15, 26, 43, 45, 47, 50

Sect. 5.4 # 3-10, 15, 17, 26-30, 41, 42, 61